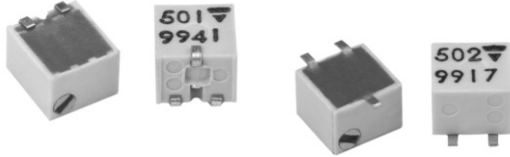


## Surface Mount Miniature Trimmers Multi-Turn Cermet Sealed



The TSM4 trimming potentiometer has been designed for surface mount applications and offers volumetric efficiency  $5 \times 5 \times 3.7 \text{ mm}^3$  with high performance and stability.

The TSM4 design is suitable for both manual or automatic operation, and can withstand vapor phase and reflow soldering techniques.

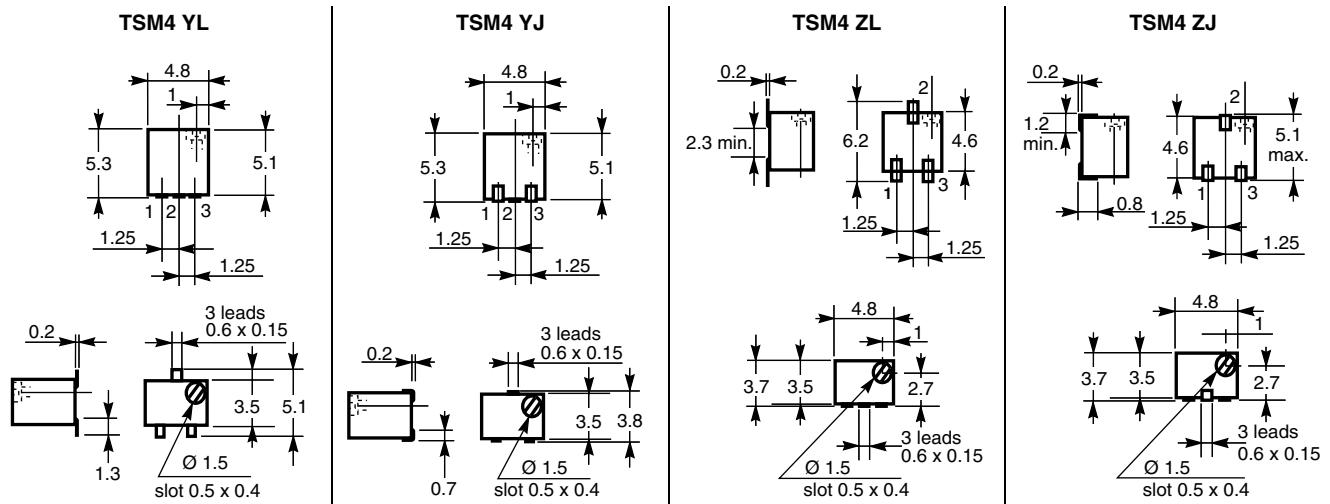
### FEATURES

- 0.25 W at 85 °C
- Professional grade
- Test according to CECC 41 000
- Wide ohmic range (10  $\Omega$  to 1 M $\Omega$ )
- Low contact resistance variation (2 % or 3 %)
- Small size for optimum packing density
- Suitable for both manual or automatic operation

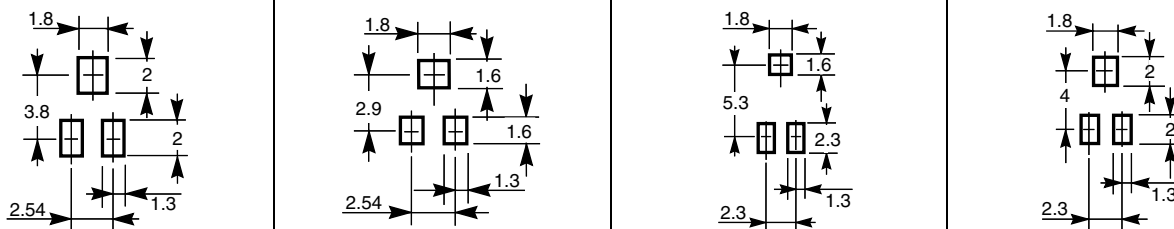


**RoHS**  
COMPLIANT

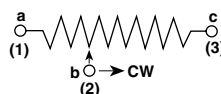
### DIMENSIONS in millimeters



### RECOMMENDED SOLDERING AREAS



### CIRCUIT DIAGRAM



Tolerances unless otherwise specified  $\pm 0.5$



ELECTRICAL SPECIFICATIONS		
Resistive Element		Cermet
Electrical Travel		11 turns ± 2
Resistance Range		10 Ω to 1 MΩ
Standard Series		1 - 2 - 5
Tolerance Standard		± 10 %
Power Rating	Linear	0.25 W at + 85 °C
	Logarithmic	Not applicable
Temperature Coefficient		See Standard Resistance Element Table
Limiting Element Voltage (Linear Law)		200 V
Contact Resistance Variation (Typical)		2 % or 3 Ω
End Resistance (Typical)		1 Ω
Dielectric Strength (RMS)		600 V
Insulation Resistance		10 <sup>6</sup> MΩ

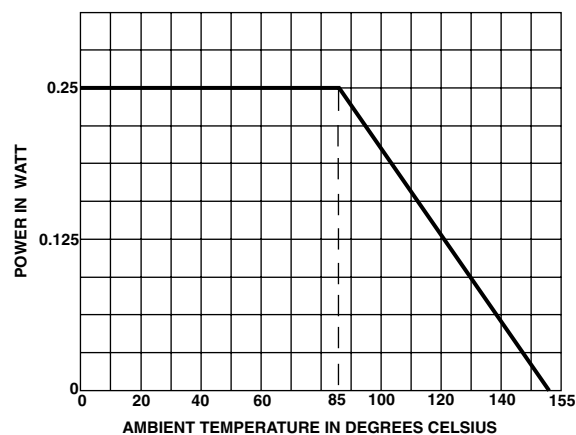
## MECHANICAL SPECIFICATIONS

Mechanical Travel	13 turns ± 2
Operating Torque (max. Ncm)	1
End Stop Torque (Ncm)	clutch action (2 turns max)
Unit Weight (max. g)	0.15
Wiper (actual travel)	positioned at approx. 50 %

## ENVIRONMENTAL SPECIFICATIONS

Temperature Range	- 55 °C to + 125 °C
Climatic Category	55/125/56
Sealing	sealed container solder immersion IP67
MSL Level	1

## POWER RATING CHART



PERFORMANCE			
TESTS	CONDITIONS	TYPICAL VALUES AND DRIFTS	
		$\frac{\Delta RT}{RT}$ (%)	$\frac{\Delta R_{1-2}}{R_{1-2}}$ (%)
Load Life	1000 hours at rated power 90'/30' - ambient temperature + 85 °C	± 2 % Contact resistance variation: $\Delta > 1$ % R <sub>n</sub>	± 3 %
Moisture Resistance	MIL STD 202 Method 106 10 cycles of 24 hours constituted with damp heat - cold - vibrations	± 2 % Dielectric strength: 1000 V RMS Insulation resistance: > 10 <sup>4</sup> MΩ	± 3 %
Long Term Damp Heat	Temperature 40 °C - RH 93 % 56 days	± 2 % Dielectric strength: 1000 V <sub>RMS</sub> Insulation resistance: > 10 <sup>4</sup> MΩ	± 3 %
Thermal Shock	- 55 °C to + 125 °C - 5 cycles	± 1 %	$\frac{\Delta V_{1-2}}{V_{1-3}} \leq \pm 2$ %
Rotational Life (Electrical and Mechanical)	100 cycles - rated power	± (3 % + 3 Ω)	
Shock	MIL STD 202 Method 213/1 100 g - 6 ms 3 successive shocks in 3 directions	± 1 %	$\frac{\Delta V_{1-2}}{V_{1-3}} \leq \pm 1$ %
Vibration	MIL STD 202 Method 204/D 20 g - 12 hours	± 1 %	$\frac{\Delta V_{1-2}}{V_{1-3}} \leq \pm 1$ %

STANDARD RESISTANCE ELEMENT DATA					
STANDARD RESISTANCE VALUES	LINEAR LAW			TYPICAL TCR - 55 °C + 125 °C	
	MAX. POWER AT 85 °C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH ELEMENT		
Ω	W	V	mA	ppm/°C	
10	0.25 ↓	1.58	158	± 100	
20		2.23	112		
50		3.53	77		
100		5.00	50		
200		7.07	35		
500		11.2	22		
1K		15.8	15.8		
2K		22.3	11.2		
5K		35.3	7.1		
10K		50.0	5.0		
20K		70.7	3.5		
50K		112	2.2		
100K		158	1.6		
200K		0.25	200		1.0
500K		0.08	200		0.4
1M	0.04	200	0.2		

**MARKING**

VISHAY trademark, ohmic value, manufacturing date.

The ohmic value is indicated by a 3 figure code, the first two digits are significant figures, the third one is the multiplier.

 Example: 100 = 10 Ω  
 101 = 100 Ω  
 102 = 1000 Ω  
 503 = 50 000 Ω

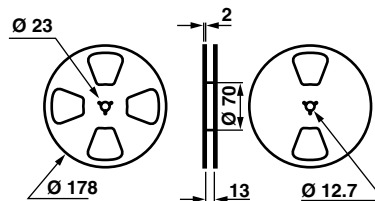
**SOLDERING RECOMMENDATIONS**

see Application notes

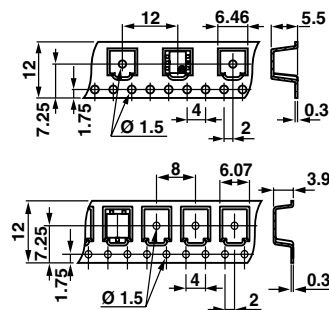
**PACKAGING**

 On tape and reel, by 500 pieces for Z version: code TR500, or 250 pieces for Y version: code TR250.  
 In bulk on request (plastic box of 50 pieces): code BO50.

Version Y



Version Z


**ORDERING INFORMATION**

 TSM4  
 SERIES

 YL  
 STYLE

 500 kΩ  
 OHMIC VALUE

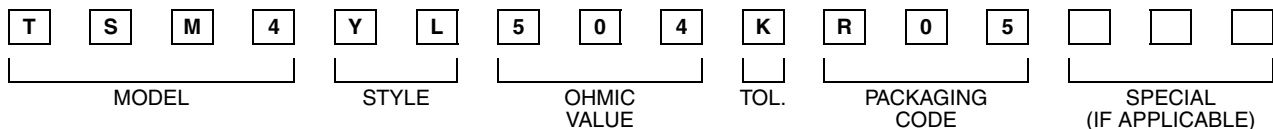
 ± 10 %  
 TOLERANCE

 TR250  
 PACKAGING

 e3  
 LEAD FINISH

 Version Z: code TR500  
 Version Y: code TR250  
 On request: BO50

e3: pure Sn

**SAP PART NUMBERING GUIDELINES**


See the end of this data book for conversion tables



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